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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,451	01/09/2007	Kazuyuki Kiriama	Q97358	9230
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WASHINGTON, DC 20037-3213				
EXAMINER				
MCCAIG, BRIAN A				
ART UNIT		PAPER NUMBER		
1797				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/594,451

Applicant(s)

KIRIYAMA ET AL.

Examiner

BRIAN MCCAIG

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/88)
- Paper No(s)/Mail Date See Continuation Sheet
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :September 26, 2006 and July 17, 2008.

DETAILED ACTION

Summary

1. This is the initial Office action based on the 10/594451 application filed September 26, 2006.
2. Claims 1-7 are pending and have been fully considered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- a. Determining the scope and contents of the prior art.
- b. Ascertaining the differences between the prior art and the claims at issue.
- c. Resolving the level of ordinary skill in the pertinent art.
- d. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
6. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over FUJIKAWA ET AL (WO 03/000410 A1) in view of CHOCA (US 4066572), hereafter referred to as FUJIKAWA and CHOCA, respectively.

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7. For all subsequent discussions of the teachings of FUJIKAWA, which is written in Japanese, reference will be made to the equivalent English version US 2003/0173256 A1.

8. With respect to claim 1, FUJIKAWA discloses a catalyst for hydrotreating a hydrocarbon oil, which comprises an inorganic oxide support and having provided thereon:

- a. at least one selected from metals in the Group 6 of the periodic table in an amount of from 10 to 30% by weight,
- b. at least one selected from metals in the Group 8 of the periodic table in an amount of from 1 to 15% by weight, and
- c. carbon in an amount of from 2 to 14% by weight, in terms of respective oxides on the basis of the catalyst.

wherein the catalyst has a specific surface area of from 220 to 300 m²/g, a pore volume of from 0.35 to 0.6 ml/g, and a mean pore diameter of from 60 to 95 angstroms [all contained in abstract].

9. FUJIKAWA also discloses that 1.5 to 6% by weight of a phosphorus oxide is impregnated on the catalyst support [paragraph 0078]. However, the reference does not appear to explicitly disclose that the catalyst support contains a phosphorus oxide in an amount of 15% by weight or less on the basis of the support.

10. However, CHOCA, which is concerned with the catalyst supports for hydrotreatment processes, discloses a phospho-alumina catalyst support suitable for desulfurization with Group VI and Group VIII metals, which have similar characteristics to those of the instant application including similar surface areas and mean pore diameters [Table 1], in which the phosphorus oxide is present in an amount ranging from 5 to 30% by weight [column 2, lines 10-19; column 6, lines 45-53; and column 7, lines 27-34].

11. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the catalyst of FUJIKAWA with the catalyst support of CHOCA in order to increase the size of the pore diameter of the support so that desulfurization activity may increase by permitting diffusion of sulfur catalysts into the catalyst pores [note increased pore diameters of CHOCA relative to FUJIKAWA in Table 1 of the latter; see also column 2, lines 4-8

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regarding average pore diameter being controlled by proportion of phosphorus present during preparation of the support]. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

12. With respect to claim 2, FUJIKAWA discloses a ratio by weight between the metal in Group 8 of the periodic table and the metal in Group 6 of the periodic table as a value of $[\text{metal in the Group 8}]/([\text{metal in the Group 8}]+(\text{metal in the Group 6})]$ is from 0.1 to 0.25 in terms of the respective oxides [paragraph 0056].

13. With respect to claim 3, modified FUJIKAWA does not appear to explicitly disclose that when a line analysis in the crosswise direction of cross-section through the center using an electron probe microanalysis (EPMA) apparatus, a phosphorus atom distribution satisfies the following equation (i):

$$(i) \quad S = \exp(0.04 \times I_{\text{ave}} + 0.013 \times I_{\text{max}} - 0.014 \times I_{\text{min}}) \leq 5.0$$

wherein I_{max} is a maximum value of the measured value of the concentration of the phosphorus atom by EPMA line analysis, I_{min} is a minimum value of the measured value of the concentration of the phosphorus atom by EPMA line analysis, and I_{ave} is an average value of the measured value of the concentration of the phosphorus atom by EPMA line analysis.

14. However, since the materials comprising the catalyst support of modified FUJIKAWA as well as the method of preparation of the support [see CHOCA column 5, line 22 and column 6, line 45 to column 7, line 10] are the similar to those disclosed in the instant application, it is expected that the catalyst support of modified FUJIKAWA has the limitation recited in claim 3 of the instant application.

15. With respect to claims 4 and 6, reference is made to the discussion of modified FUJIKAWA concerning the limitations of claim 1 in the instant application. Furthermore, FUJIKAWA discloses the use of an organic acid [paragraphs 0080-0081, 0083-0084, and 0086], and CHOCA discloses calcining the support at a temperature of about 565° C for 3 hours [column 5, line 22].

16. With respect to claim 5, FUJIKAWA discloses that the catalytic support is prepared by a method of kneading the starting materials [paragraphs 0114 and 0118].

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17. With respect to claim 7, FUJIKAWA discloses that the catalytic reaction is carried out at a hydrogen partial pressure of from 3 to 8 MPa, a temperature of from 300 to 420°C, and a liquid hourly space velocity of from 0.3 to 5 hr⁻¹ [abstract].

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN MCCAIG whose telephone number is (571) 270-5548. The examiner can normally be reached on M-F 8-430.

19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAM
12/31/2008

/Glenn A Caldarola/
Acting SPE of Art Unit 1797